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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,976	06/25/2003	Daniel G. Stearns	XENOP009	6444
58766	7590	12/10/2008		
Beyer Law Group LLP P.O. BOX 1687 Cupertino, CA 95015-1687			EXAMINER GUPTA, VANI	
			ART UNIT 3768	PAPER NUMBER
			MAIL DATE 12/10/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/606,976	Applicant(s) STEARNS ET AL.	
	Examiner VANI GUPTA	Art Unit 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period **will** apply and **will** expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply **will**, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/24/2008;11/10/2008</u> . | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

1. This action is in response to the Applicant's arguments and amendments filed on October 24, 2008.
2. The Amendment filed on October 24, 2008 has been entered. Claim 1 is currently amended; claims 2 - 40 are original; and claims 41 - 52 are cancelled. Accordingly, claims 1 - 40 are pending.

Response to Remarks/Arguments and Amendments

3. Examiner acknowledges amendments to Claim 1 to recite "using a processing system." Applicant's arguments, see page 7, filed October 24, 2008, with respect to this amendment have been fully considered and are persuasive. Therefore, the previous 35 USC Code 101 rejection of claims 1 - 40 is withdrawn.
4. Examiner also acknowledges that claims 41 - 52 have been cancelled. Applicant's arguments, see page 7, filed October 24, 2008, with respect to this amendment have been fully considered and are persuasive. Therefore, the previous 35 USC Code 102(e) rejection of these claims have been withdrawn.
5. Examiner acknowledges Applicant's submission that the prior art was commonly owned at the time the present invention was made. That is, assignment of the present invention to Xenogen Corporation is recorded on reel/frame 016566/0251 and assignment of Nilson to Xenogen Corporation is recorded on reel/frame 012159/0249.

Applicant's arguments, see page 7, with respect to the rejection(s) of claims 1 - 40 under 35 USC 103(a) as being unpatentable over *Nilson et al. (US 6,615,063 B1)* in view of

Ntziachristos et al. (6,615,063 B1), further in view of *Bruder et al.* (7,263,157 B2) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection have been made as follows.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 1 – 4 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Sevick-Muraca et al. (US 5,865,754).**

Regarding claims 1 – 3 and 26 – 34, *Sevick-Muraca et al.* (hereinafter *Sevick-Muraca*) discloses a method for obtaining a three-dimensional representation of a light source distribution located inside a sample, the method comprising:

- a. providing surface light image data from light emitted from a surface of the sample originating from the light source distribution located inside the sample (*col. 2, line 32 – col. 3, line 2*); and
- b. using a processing system (**fig. 1, 160**), reconstructing a three-dimensional representation of the light source distribution internal to the sample based on the surface light emission data (*col. 4, line 67 – col. 7, line 53*)¹.

With respect to claims 2 and 3, please refer to the bullet a.

¹ Of particular importance is column 7, lines 43 – 53, where *Sevick-Muraca* states that the two-dimensional representation of the fluorescing tissue can be expanded to a three-dimensional representation.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. ***Claims 5 – 10, 16 – 20, 35 – 40 are rejected under 35 USC 103(a) as being obvious over Sevick-Muraca et al. (US 5,865,754) in view of Ntziachristos et al. (6,615,063 B1).***

Regarding Claim 5, Sevick-Muraca discloses a method for obtaining a three-dimensional representation of a light source distribution located inside a sample, as presented above.

Sevick-Muraca differs from Claim 5 in that he does not appear to specifically disclose creating a set of volume elements, or voxels.

However, Ntziachristos teaches fluorescence-mediated molecular tomography, wherein diffraction tomography segments the volume under investigation into a number of discrete voxels, or volume elements, into a “mesh” (col. 10, line 34 - col. 11, line 18).

Accordingly, Ntziachristos complements the disclosing of Sevick-Muraca by teaching an cost-efficient invention that enables three-dimensional localization in deep tissues and quantization of molecular probes (Abstract; col. 2, lines 34 – 41; and col. 12, lines 6 – 30).

Therefore, it would have been prima facie obvious to combine Sevick-Muraca with the teachings of Ntziachristos to include creation of voxels to obtain the invention in the instant claim 5.

Regarding claims 6 – 9 and 16 – 20, see Sevick-Muraca (col. 4, line 51 – col. 15, line 55) and Ntziachristos (col. 3, line 16 – col. 4, line 58; and col. 12, line 45 – col. 21, line 62).

Regarding Claim 10, Ntziachristos presents a cost-efficient embodiment of his invention, with which one can collect bulk information, using economical, massively parallel continuous-wave measurements (~1000 channels); and highly specific information of absorption and scattering parameters, using smaller array of time-domain source-detection channels (~50 – 100 channels) (col. 12, lines 6 – 30).

Regarding claims 35 – 40, see Ntziachristos (**fig. 2A**, *col. 12, lines 45 – col. 18, line 67*)

9. **Claims 11 – 15 and 21 – 25 are rejected under 35 USC 103(a) as being over Sevick-Muraca et al. (US 5,865,754) in view of Ntziachristos et al. (6,615,063 B1), further in view of Bruder et al. (7,263,157 B2).**

Regarding claims 11 – 15 and 21 – 25, Sevick-Muraca and Ntziachristos disclose a method for obtaining a three-dimensional representation of a light source distribution inside a sample, as explained above.

Sevick-Muraca and Ntziachristos differs from claims 11 – 15 and 21 – 25 in that Sevick-Muraca and Ntziachristos does not specifically disclose details a cost function that is useful in optimizing the retrieval or measurement of surface photon density.

However, Bruder teaches the use of a cost function that is a sum of weighted addends. Each addend can be formed from the difference of a measurement value associated with the detector and a mapping function, the mapping function describing the connection between a theoretical measurement value of the reference position of the reference object mapped in the detector dependent on the reference position, the geometry of both acquisition systems, the rotation angle position and the system angle to be optimized. The specification of the mapping function preferably results in the form of fan geometry coordinates (col. 2, line 41 through col. 3, line 30).

Based on the mapping function, a cost function can be formed and minimized or optimized such that reference position(s) of a reference object and system angles can be determined. The optimization of the cost function can be achieved by standard methods that are commonly known; such as the Simplex Method, and other algorithms or optimization methods, utilizing linear ordinary differential equations (for example, Green's function and Finite Element Modeling) (col. 3, lines 50 – col. 7, line 3).

Accordingly, Bruder complements Sevick-Muraca and Ntziachristos by teaching a tomography apparatus with at least two acquisition systems are respectively each disposed in the

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azimuthal direction at respective specific system angles around a common rotation axis. This enables artifact-free reconstruction of a slice or volume image using the system angles determined in this manner (Abstract).

Therefore, it would have been prima facie obvious to combine Sevick-Muraca and Ntziachristos with the teachings of with Bruder to include optimization methods to obtain the invention in the instant claims 11 – 15 and 21 – 25.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: *Potter* (US 5,205,291) for in-vivo fluorescence photometer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VANI GUPTA whose telephone number is (571)270-5042. The examiner can normally be reached on Monday - Friday (8:30 am - 5:30 pm; EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-2083. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/V. G./

Examiner, Art Unit 3768

/Long V Le/

Supervisory Patent Examiner, Art Unit 3768